

OHS16550

SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MDL INFORMATION SYSTEMS, INC.
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SUBSTANCE: NITRIC ACID

TRADE NAMES/SYNONYMS:

AQUA FORTIS; WFNA; RFNA; HYDROGEN NITRATE; AZOTIC ACID; NITRYL HYDROXIDE;
NITAL; AQUAFORTIS HYDROGEN NITRATE (EM SCIENCE); UN 2031; STCC 4918528; HNO3;
OHS16550; RTECS QU5775000

CHEMICAL FAMILY: acids, inorganic

CREATION DATE: Dec 04 1984

REVISION DATE: Dec 11 2001

SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: NITRIC ACID
CAS NUMBER: 7697-37-2
EC NUMBER (EINECS): 231-714-2
PERCENTAGE: 70

COMPONENT: WATER
CAS NUMBER: 7732-18-5
EC NUMBER (EINECS): 231-791-2
PERCENTAGE: 30

SECTION 3 HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=3 FIRE=0 REACTIVITY=2

EMERGENCY OVERVIEW:

COLOR: colorless to yellow

PHYSICAL FORM: liquid

ODOR: irritating odor

MAJOR HEALTH HAZARDS: respiratory tract burns, skin burns, eye burns, mucous

membrane burns

PHYSICAL HAZARDS: May ignite combustibles. May react on contact with water.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: burns

LONG TERM EXPOSURE: same as effects reported in short term exposure

SKIN CONTACT:

SHORT TERM EXPOSURE: burns

LONG TERM EXPOSURE: same as effects reported in short term exposure

EYE CONTACT:

SHORT TERM EXPOSURE: burns

LONG TERM EXPOSURE: same as effects reported in short term exposure

INGESTION:

SHORT TERM EXPOSURE: burns

LONG TERM EXPOSURE: same as effects reported in short term exposure

CARCINOGEN STATUS:

OSHA: No

NTP: No

IARC: No

SECTION 4 FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing and shoes before reuse. Destroy contaminated shoes.

EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: Contact local poison control center or physician immediately. Never make an unconscious person vomit or drink fluids. Give large amounts of water or milk. Allow vomiting to occur. When vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

NOTE TO PHYSICIAN: For inhalation, consider oxygen. Avoid gastric lavage or emesis.

SECTION 5 FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Negligible fire hazard. Oxidizer. May ignite or explode on contact with combustible materials.

EXTINGUISHING MEDIA: regular dry chemical, soda ash, water

Large fires: Flood with water. Apply water from a protected location or from a safe distance.

FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Evacuation radius: 800 meters (1/2 mile). Flood with water. Avoid inhalation of material or combustion by-products.

FLASH POINT: No data available.

SECTION 6 ACCIDENTAL RELEASE MEASURES

AIR RELEASE:

Reduce vapors with water spray. Collect runoff for disposal as potential hazardous waste. Reduce vapors with water spray. Collect runoff for disposal as potential hazardous waste.

SOIL RELEASE:

Trap spilled material at bottom in deep water pockets, excavated holding areas or within sand bag barriers. Dike for later disposal. Absorb with sand or other non-combustible material. Add an alkaline material (lime, crushed limestone, sodium bicarbonate, or soda ash). Trap spilled material at bottom in deep water pockets, excavated holding areas or within sand bag barriers. Dike for later disposal. Absorb with sand or other non-combustible material. Add an alkaline material (lime, crushed limestone, sodium bicarbonate, or soda ash).

WATER RELEASE:

Neutralize. Neutralize.

OCCUPATIONAL RELEASE:

Avoid contact with combustible materials. Do not touch spilled material. Stop

leak if possible without personal risk. Reduce vapors with water spray. Do not get water inside container. Small spills: Flood with water. Keep unnecessary people away, isolate hazard area and deny entry. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

SECTION 7 HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Protect from physical damage. Keep separated from incompatible substances. Store in a well-ventilated area. Avoid contact with light. Keep separated from incompatible substances. Notify State Emergency Response Commission for storage or use at amounts greater than or equal to the TPQ (U.S. EPA SARA Section 302). SARA Section 303 requires facilities storing a material with a TPQ to participate in local emergency response planning (U.S. EPA 40 CFR 355.30). NFPA 430 Code for the Storage of Liquid and Solid Oxidizing Materials.

SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

NITRIC ACID:

- 2 ppm (5 mg/m³) OSHA TWA
- 4 ppm (10 mg/m³) OSHA STEL (vacated by 58 FR 35338, June 30, 1993)
- 2 ppm ACGIH TWA
- 4 ppm ACGIH STEL
- 2 ppm (5 mg/m³) NIOSH recommended TWA 10 hour(s)
- 4 ppm (10 mg/m³) NIOSH recommended STEL
- 5.2 mg/m³ (2 ml/m³) DFG MAK (peak limitation category - I, with excursion factor of 1)
- 2 ppm (5.2 mg/m³) UK OES TWA
- 4 ppm (10 mg/m³) UK OES STEL

MEASUREMENT METHOD: Silica gel tube; Sodium bicarbonate/Sodium carbonate; Ion chromatography; NIOSH IV # 7903, Inorganic Acids

VENTILATION: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

25 ppm

Any supplied-air respirator operated in a continuous-flow mode.

Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against this substance.

Only non-oxidizable sorbents are allowed (not charcoal).

Any air-purifying respirator with a full facepiece and a canister providing protection against this substance.

Only non-oxidizable sorbents are allowed (not charcoal).

Any self-contained breathing apparatus with a full facepiece.

Any supplied-air respirator with a full facepiece.

Escape -

Any air-purifying respirator with a full facepiece and a canister providing protection against this substance.

Only non-oxidizable sorbents are allowed (not charcoal).

Any appropriate escape-type, self-contained breathing apparatus.

For Unknown Concentrations or Immediately Dangerous to Life or Health -

Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.

Any self-contained breathing apparatus with a full facepiece.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: liquid

COLOR: colorless to yellow

ODOR: irritating odor

MOLECULAR WEIGHT: 63.01

MOLECULAR FORMULA: H-N-O₃

BOILING POINT: 181 F (83 C)

FREEZING POINT: -44 F (-42 C)

VAPOR PRESSURE: 47.9 mmHg @ 20 C

VAPOR DENSITY (air=1): 3.2

SPECIFIC GRAVITY (water=1): 1.5027 @ 25 C

WATER SOLUBILITY: soluble

PH: Not available

VOLATILITY: Not available

ODOR THRESHOLD: Not available

EVAPORATION RATE: Not available

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

SOLVENT SOLUBILITY:

Soluble: ether

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: May react with evolution of heat on contact with water.

CONDITIONS TO AVOID: Avoid contact with combustible materials. Keep dry.
Dangerous gases may accumulate in confined spaces. Keep out of water
supplies and sewers.

INCOMPATIBILITIES: acids, combustible materials, halo carbons, amines, bases,
oxidizing materials, metals, halogens, metal salts, metal oxides, reducing
agents, peroxides, metal carbide, cyanides

NITRIC ACID:

ACETIC ACID: May react explosively.

ACETIC ANHYDRIDE: Explosive reaction by friction or impact.

ACETONE: May react explosively.

ACETONITRILE: Explosive mixture.

4-ACETOXY-3-METHOXYBENZALDEHYDE: Exothermic reaction.

ACROLEIN: Temperature and pressure increase in closed container.

ACRYLONITRILE: Explosive reaction at 90 C.

ACRYLONITRILE-METHACRYLATE COPOLYMER: Incompatible.

ALCOHOLS: Possible violent reaction or explosion; formation of explosive
compound in the presence of heavy metals.

ALKANETHIOLS: Exothermic reaction with possible ignition.

2-ALKOXY-1,3-DITHIA-2-PHOSPHOLANE: Ignition reaction.

ALLYL ALCOHOL: Temperature and pressure increase in closed container.

ALLYL CHLORIDE: Temperature and pressure increase in closed container.

AMINES (ALIPHATIC OR AROMATIC): Possible ignition reaction.

2-AMINOETHANOL: Temperature and pressure increase in closed container.

2-AMINOTHIAZOLE: Explosive reaction.

AMMONIA (GAS): Burns in an atmosphere of nitric acid vapor.

AMMONIUM HYDROXIDE: Temperature and pressure increase in closed container.

AMMONIUM NITRATE: Forms explosive mixture.

ANILINE: Ignites on contact.

ANILINIUM NITRATE: Forms explosive solution.

ANION EXCHANGE RESINS: Possible violent exothermic reaction.

ANTIMONY: Violent reaction.

ARSINE: Explosive reaction.

ARSINE-BORON TRIBROMIDE: Violent oxidation.

BASES: Reacts.

BENZENE: Explosive reaction.

BENZIDINE: Spontaneous ignition.

BENZONITRILE: Possible explosion.

BENZOTHIOPHENE DERIVATIVES: Formation of possibly explosive compounds.
N-BENZYL-N-ETHYLANILINE: Vigorous decomposition.
1,4-BIS(METHOXYMETHYL)2,3,5,6-TETRAMETHYLBENZENE: Gas evolution.
BISMUTH: Intense exothermic reaction or explosion.
1,3-BIS(TRIFLUOROMETHYL)BENZENE: Possible explosion.
BORON: Violent reaction with incandescence.
BORON DECAHYDRIDE: Explosive reaction.
BORON PHOSPHIDE: Ignition reaction.
BROMINE PENTAFLUORIDE: Ignition reaction.
N-BUTYL MERCAPTAN: Ignition reaction.
N-BUTYRALDEHYDE: Temperature and pressure increase in closed container.
CADMIUM PHOSPHIDE: Explosive reaction.
CALCIUM HYPOPHOSPHITE: Ignition reaction.
CARBON (PULVERIZED): Violent reaction.
CELLULOSE: Forms easily combustible ester.
CHLORATES: Reacts.
CHLORINE: Incompatible.
CHLORINE TRIFLUORIDE: Violent reaction.
CHLOROBENZENE: Possible explosion.
4-CHLORO-2-NITROANILINE: Forms explosive compound.
CHLOROSULFONIC ACID: Temperature and pressure increase in closed container.
COAL: Explosive mixture.
COATINGS: Attacks.
CRESOL: Temperature and pressure increase in closed container.
CROTONALDEHYDE: Violent decomposition with ignition.
CUMENE: Temperature and pressure increase in closed container.
CUPRIC NITRIDE: Explosive reaction.
CUPROUS NITRIDE: Violent reaction.
CYANATES: Possible explosive reaction.
CYCLOHEXANONE: Violent reaction.
CYCLOHEXYLAMINE: Forms explosive compound.
CYCLOPENTADIENE: Explosive reaction.
1,2-DIAMINOETHANEBIS(TRIMETHYLGOLD): Explosive reaction.
DIBORANE: Spontaneous ignition.
DI-2-BUTOXYETHYL ETHER: Violent decomposition reaction.
2,6-DI-T-BUTYL PHENOL: Formation of explosive compound.
DICHLOROETHANE: Forms shock and heat sensitive mixture.
DICHLOROETHYLENE: Forms explosive compound.
DICHLOROMETHANE: Forms explosive solution.
DICYCLOPENTADIENE: Spontaneous ignition.
DIENES: Ignition reaction.
DIETHYLAMINO ETHANOL: Possible explosion.
DIETHYL ETHER: Possible explosion.
3,6-DIHYDRO-1,2,2H-OXAZINE: Explosive interaction.
DIISOPROPYL ETHER: Temperature and pressure increase in closed container.
DIMETHYLAMINOMETHYLFERROCENE: Violent decomposition if heated.
DIMETHYL ETHER: Forms explosive compound.
DIMETHYL HYDRAZINE: Ignites on contact.

DIMETHYL SULFOXIDE + 1,4-DIOXANE: Explosion.
DIMETHYL SULFOXIDE + <14% WATER: Explosive reaction.
DINITROBENZENE: Explosion hazard.
DINITROTOLUENE: Explosive reaction.
DIOXANE + PERCHLORIC ACID: Possible explosion.
DIPHENYL DISTIBENE: Explosive oxidation.
DIPHENYL MERCURY + CARBON DISULFIDE: Violent reaction.
DIPHENYL TIN: Ignition reaction.
DISODIUM PHENYL ORTHOPHOSPHATE: Violent explosion.
DIVINYL ETHER: Possible ignition reaction.
EPICHLOROHYDRIN: Temperature and pressure increase in closed container.
ETHANESULFONAMIDE: Explosive reaction.
ETHOXY-ETHYLENE DITHIOPHOSPHATE: Ignition on contact.
M-ETHYL ANILINE: Ignition reaction.
ETHYLENE DIAMINE: Temperature and pressure increase in closed container.
ETHYLENE GLYCOL: Forms shock and heat sensitive mixture.
ETHYLENEIMINE: Temperature and pressure increase in closed container.
5-ETHYL-2-METHYL PYRIDINE: Explosive reaction.
ETHYL PHOSPHINE: Ignition reaction.
5-ETHYL-2-PICOLINE: Forms explosive compounds.
FERROUS OXIDE (POWDERED): Intense exothermic reaction.
FLUORINE: Possible explosive reaction.
FORMIC ACID: Exothermic reaction with release of toxic gases.
2-FORMYLAMINO-1-PHENYL-1,3-PROPANEDIOL: Possible explosion.
FUEL OIL (BURNING): Explosion.
FULMINATES: Reacts.
FURFURYLIDENE KETONES: Ignites on contact.
GERMANIUM: Violent reaction.
GLYCEROL: Possible explosion.
GLYOXAL: Temperature and pressure increase in closed container.
HEXALITHIUM DISILICIDE: Explosive reaction.
HEXAMETHYLBENZENE: Possible explosion.
2,2,4,4,6,6-HEXAMETHYLTRITHIANE: Explosive oxidation.
HEXENAL: Explodes on heating.
HYDRAZINE: Violent reaction.
HYDRAZOIC ACID: Energetic reaction.
HYDROGEN IODIDE: Ignition reaction.
HYDROGEN PEROXIDE: Forms unstable mixture.
HYDROGEN PEROXIDE AND KETONES: Forms explosive products.
HYDROGEN PEROXIDE AND MERCURIC OXIDE: Forms explosive compounds.
HYDROGEN PEROXIDE AND THIOUREA: Forms explosive compounds.
HYDROGEN SELENIDE: Ignition reaction.
HYDROGEN SULFIDE: Incandescent reaction.
HYDROGEN TELLURIDE: Ignition and possible explosive reaction.
INDANE AND SULFURIC ACID: Explosive reaction.
ISOPRENE: Temperature and pressure increase in closed container.
KETONES (CYCLIC): Violent reaction.
LACTIC ACID + HYDROFLUORIC ACID: Explosive reaction.

LITHIUM: Ignition reaction.
LITHIUM SILICIDE: Incandescent reaction.
MAGNESIUM: Explosive reaction.
MAGNESIUM + 2-NITROANILINE: May ignite on contact.
MAGNESIUM PHOSPHIDE: Incandescent reaction.
MAGNESIUM SILICIDE: Violent reaction.
MAGNESIUM-TITANIUM ALLOY: Forms shock and heat sensitive mixture.
MANGANESE (POWDERED): Incandescence and possible explosion.
MESITYL OXIDE: Temperature and pressure increase in closed container.
MESITYLENE: Possible explosive reaction.
METALS: Violent reaction with explosion or ignition.
METAL ACETYLIDES: Violent or explosive reaction.
METAL CARBIDES: Violent or explosive reaction.
METAL CYANIDES: Explosive reactions.
METAL FERRICYANIDE OR FERROCYANIDE: Violent reaction.
METAL SALICYLATES: Forms explosive compounds.
METAL THIOCYANATES: Possible explosion.
2-METHYLBENZIMIDAZOLE + SULFURIC ACID: Possible explosive reaction.
4-METHYLCYCLOHEXANONE: Explosive reaction.
2-METHYL-5-ETHYLPYRIDINE: Temperature and pressure increase in closed container.
METHYL THIOPHENE: Ignition reaction.
NEODYMIUM PHOSPHIDE: Violent reaction.
NICKEL TETRAPHOSPHIDE: Ignition reaction.
NITRO AROMATIC HYDROCARBONS: Forms highly explosive products.
NITROBENZENE: Explosive reaction, especially in the presence of water.
NITROMETHANE: Explosive reaction.
NITRONAPHTHALENE: Explosion hazard.
NON-METAL OXIDES: Explosive reaction.
OLEUM: Temperature and pressure increase in closed container.
ORGANIC MATERIALS: Fire and explosion hazard.
ORGANIC SUBSTANCES: Possible explosion.
PERCHLORATES: Possible explosion.
PHENYL ACETYLENE + 1,1-DIMETHYLHYDRAZINE: Violent reaction.
PHENYL ORTHOPHOSPHORIC ACID DISODIUM SALT: Forms explosive products.
PHOSPHINE + OXYGEN: Spontaneous ignition.
PHOSPHONIUM IODIDE: Ignition reaction.
PHOSPHORUS (VAPOR): Ignites when heated.
PHOSPHOROUS HALIDES: Ignition reaction.
PHOSPHORUS TETRAIODIDE: Vigorous reaction.
PHOSPHORUS TRICHLORIDE: Explosive reaction.
PHTHALIC ACID: Possible explosive reaction.
PHTHALIC ANHYDRIDE: Exothermic reaction and forms explosive products.
PICRATES: Reacts.
PLASTICS: Attacks.
POLYALKENES: Intense reaction.
POLYDIBROMOSILANES: Explosive reaction.
POLY(ETHYLENE OXIDE) DERIVATIVES: Possible explosion.

POLYPROPYLENE: Temperature and pressure increase in a closed container.
POLY(SILYLENE): Ignition.
POLYURETHANE (FOAM): Vigorous reaction.
POTASSIUM HYPOPHOSPHITE: Explosive reaction.
POTASSIUM PHOSPHINATE: Explodes on evaporation.
B-PROPIOLACTONE: Temperature and pressure increase in closed container.
PROPIOPHENONE + SULFURIC ACID: Exothermic reaction above -5 C.
PROPYLENE GLYCOL + HYDROFLUORIC ACID + SILVER NITRATE: Explosive mixture.
PROPYLENE OXIDE: Temperature and pressure increase in closed container.
PYRIDINE: Temperature and pressure increase in closed container.
PYROCATECHOL: Ignites on contact.
REDUCING AGENTS: Possible explosive or ignition reaction.
RESORCINOL: Possible explosion.
RUBBER: Vigorous reaction, possible explosion.
SELENIUM: Vigorous reaction.
SELENIUM HYDRIDE: Ignition or incandescent reaction.
SELENIUM IODOPHOSPHIDE: Explosive reaction.
SILICON: Violent reaction.
SILICONE OIL: Possible explosion.
SILVER BUTEN-3-YNIDE: Explosion.
SODIUM: Spontaneous ignition.
SODIUM AZIDE: Exothermic reaction.
SODIUM HYDROXIDE: Temperature and pressure increase in a closed container.
STIBINE: Explosive reaction.
SUCROSE (SOLID): Vigorous reaction.
SULFAMIC ACID: Violent reaction with evolution of toxic nitrous oxide.
SULFIDES: Reacts.
SULFUR DIOXIDE: Explosive reaction.
SULFUR HALIDES: Violent reaction.
SULFURIC ACID: Possible explosion.
SULFURIC ACID + GLYCERIDES: Explosive reaction.
SULFURIC ACID + TEREPHTHALIC ACID: Violent reaction.
SURFACTANTS + PHOSPHORIC ACID: Explosion hazard.
TERPENES: Spontaneous ignition.
TETRABORANE: Explosive reaction.
TETRABORANE DECAHYDRIDE: Explosive reaction.
TETRAPHOSPHOROUS DIIODOTRISELENIDE: Explosive reaction.
TETRAPHOSPHOROUS IODIDE: Ignites on contact.
TETRAPHOSPHOROUS TETRAOXIDE TRISULFIDE: Violent reaction.
THIOALDEHYDES: Violent reaction.
THIOKETONES: Violent reaction.
THIOPHENES: Explosive reaction.
TITANIUM: Forms shock-sensitive compound.
TITANIUM ALLOYS: Possible explosive reaction.
TITANIUM-MAGNESIUM ALLOY: Possible explosion on impact.
TOLUENE: Violent reaction.
TOLUIDENE: Ignition reaction.
1,3,5-TRIACETYLHEXAHYDRO-1,3,5-TRIAZINE + TRIFLUOROACETIC ANHYDRIDE:

Explosive

reaction.

TRIAZINE: Violently explosive reaction.

TRICADMIUM DIPHOSPHIDE: Explosive reaction.

TRIETHYLGALLIUM MONOETHYL ETHER COMPLEX: Ignition reaction.

TRIMETHYLTRIOXANE: Intense reaction.

TRIS(IODOMERCURI)PHOSPHINE: Violent decomposition.

TRITHIOACETONE: Explosive reaction.

TURPENTINE: Explosive mixture.

UNSYMMETRICAL DIMETHYL HYDRAZINE: Spontaneous ignition.

URANIUM: Explosive reaction.

URANIUM ALLOY: Violent reaction.

URANIUM DISULFIDE: Violent reaction.

URANIUM-NEODYMIUM ALLOYS: Explosive reaction.

VINYL ACETATE: Temperature and pressure increase in closed container.

VINYLDENE CHLORIDE: Temperature and pressure increase in closed container.

WOOD: Possible ignition.

P-XYLENE: Intense reaction in presence of sulfuric acid.

ZINC: Incandescent reaction.

ZINC ETHOXIDE: Possible explosion.

ZIRCONIUM-URANIUM ALLOYS: Explosive reaction.

HAZARDOUS DECOMPOSITION:

Thermal decomposition products: oxides of nitrogen

POLYMERIZATION: Will not polymerize.

SECTION 11 TOXICOLOGICAL INFORMATION

NITRIC ACID:

TOXICITY DATA:

2500 ppm/1 hour(s) inhalation-rat LC50 (Dupont); 50-500 mg/kg
oral-unspecified species LD50 (Dupont); 430 mg/kg oral-human LDLo; 110 mg/kg
unreported-man LDLo; 1071 ug/m³/24 hour(s)-84 day(s) continuous
inhalation-rat TCLo; 50 ug/m³/4 hour(s)-3 day(s) intermittent inhalation-rat
TCLo

LOCAL EFFECTS:

Corrosive: inhalation, skin, eye, ingestion

ACUTE TOXICITY LEVEL:

Moderately Toxic: inhalation

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: eye disorders, respiratory
disorders, skin disorders and allergies

REPRODUCTIVE EFFECTS DATA:

21150 mg/kg oral-rat TDLo 1-21 day(s) pregnant female continuous; 2345 mg/kg
oral-rat TDLo 18 day(s) pregnant female continuous

HEALTH EFFECTS:

INHALATION:

ACUTE EXPOSURE:

NITRIC ACID: Inhalation of acidic substances may cause severe respiratory irritation with coughing, choking, and possibly yellowish burns of the mucous membranes. Other initial symptoms may include dizziness, headache, nausea, and weakness. Pulmonary edema may be immediate in the most severe exposures, but more likely will occur after a latent period of 5-72 hours. The symptoms may include tightness in the chest, dyspnea, dizziness, frothy sputum, and cyanosis. Physical findings may include hypotension, weak, rapid pulse, moist rales, and hemoconcentration. In non-fatal cases, complete recovery may occur within a few days or weeks or, convalescence may be prolonged with frequent relapses and continued dyspnea and other signs and symptoms of pulmonary insufficiency. In severe exposures, death due to anoxia may occur within a few hours after onset of the symptoms of pulmonary edema or following a relapse.

CHRONIC EXPOSURE:

NITRIC ACID: Depending on the concentration and duration of exposure, repeated or prolonged exposure to an acidic substance may cause erosion of the teeth, inflammatory and ulcerative changes in the mouth, and possibly jaw necrosis. Bronchial irritation with cough and frequent attacks of bronchial pneumonia may occur. Gastrointestinal disturbances are also possible.

SKIN CONTACT:

ACUTE EXPOSURE:

NITRIC ACID: Direct contact with liquid or vapor may cause severe pain, burns and possibly yellowish stains. Burns may be deep with sharp edges and heal slowly with scar tissue formation. Dilute solutions of nitric acid may produce mild irritation and harden the epidermis without destroying it. Concentrated acid solutions applied to over 25% of the skin area in rats produced elevated methemoglobin and blood nitrate levels.

CHRONIC EXPOSURE:

NITRIC ACID: Effects depend on the concentration and duration of exposure. Repeated or prolonged contact with acidic substances may result in dermatitis or effects similar to acute exposure.

EYE CONTACT:

ACUTE EXPOSURE:

NITRIC ACID: Direct contact with acidic substances may cause pain and lacrimation, photophobia, and burns, possibly severe. The degree of injury depends on the concentration and duration of contact. In mild burns, the epithelium regenerates rapidly and the eye recovers completely. In severe cases, the extent of injury may not be fully apparent for several weeks. Ultimately, the whole cornea may become deeply vascularized and opaque resulting in blindness. In the worst cases, the eye may be totally

destroyed. Concentrated nitric acid may impart a yellow color to the eye upon contact.

CHRONIC EXPOSURE:

NITRIC ACID: Effects depend on the concentration and duration of exposure. Repeated or prolonged exposure to acidic substances may cause conjunctivitis or effects as in acute exposure.

INGESTION:

ACUTE EXPOSURE:

NITRIC ACID: Acidic substances may cause circumoral burns with yellow discoloration and corrosion of the mucous membranes of the mouth, throat and esophagus. There may be immediate pain and difficulty or inability to swallow or speak. Epiglottal edema may result in respiratory distress and possibly asphyxia. Marked thirst, epigastric pain, nausea, vomiting and diarrhea may occur. Depending on the degree of esophageal and gastric corrosion, the vomitus may contain fresh or dark precipitated blood and large shreds of mucosa. Shock with marked hypotension, weak, rapid pulse, shallow respiration, and clammy skin may occur. Circulatory collapse may ensue and if uncorrected, lead to renal failure. In severe cases, gastric, and to a lesser degree, esophageal perforation and subsequent peritonitis may occur and be accompanied by fever and abdominal rigidity. Esophageal, gastric and pyloric stricture may occur within a few weeks, but may be delayed for months or even years. Death may result within a short time from asphyxia, circulatory collapse or aspiration of even minute amounts. Later death may be due to peritonitis, severe nephritis or pneumonia. Coma and convulsions sometimes occur terminally.

CHRONIC EXPOSURE:

NITRIC ACID: Depending on the concentration, repeated ingestion of acidic substances may result in inflammatory and ulcerative changes in the mucous membranes of the mouth and other effects as in acute ingestion. Reproductive effects have been reported in animals.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY DATA:

FISH TOXICITY: 2.8 ug/L 96 hour(s) LC50 (Mortality) Rainbow trout, donaldson trout (*Oncorhynchus mykiss*)

INVERTEBRATE TOXICITY: 16 ug/L 48 hour(s) EC50 (Immobilization) Water flea (*Daphnia magna*)

FATE AND TRANSPORT:

BIOCONCENTRATION: 17560 ug/L 30 hour(s) BCFD (Residue) Aquatic sowbug (*Asellus aquaticus*) 0.87 ug/L

SECTION 13 DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001. D002. D003.

SECTION 14 TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Nitric acid other than red fuming, with not more than 70 percent nitric acid
ID NUMBER: UN2031
HAZARD CLASS OR DIVISION: 8
PACKING GROUP: II

CANADIAN TRANSPORTATION OF DANGEROUS GOODS: No classification assigned.

LAND TRANSPORT ADR/RID:

PROPER SHIPPING NAME: Nitric acid, other than red fuming, with not more than 70 % nitric acid/Nitric acid, other than red fuming
UN NUMBER: UN2031
ADR/RID CLASS: 8
CLASSIFICATION CODE: C01
PACKING GROUP: II

AIR TRANSPORT IATA/ICAO:

PROPER SHIPPING NAME: Nitric acid, other than red fuming, with 70% or less but more than 20% nitric acid/Nitric acid, other than red fuming, with not more than 70% nitric acid
UN/ID NUMBER: UN2031
IATA/ICAO CLASS: 8
PACKING GROUP: II

MARITIME TRANSPORT IMDG:

PROPER SHIPPING NAME: Nitric acid, other than red fuming, with not more than 70% nitric acid
UN NUMBER: UN2031
IMDG CLASS: 8
PACKING GROUP: II

SECTION 15 REGULATORY INFORMATION

U.S. REGULATIONS:

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):

NITRIC ACID: 1000 LBS RQ

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):

NITRIC ACID: 1000 LBS TPQ

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40):

NITRIC ACID: 1000 LBS RQ

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):

ACUTE: Yes

CHRONIC: No

FIRE: Yes

REACTIVE: Yes

SUDDEN RELEASE: No

SARA TITLE III SECTION 313 (40 CFR 372.65):

NITRIC ACID

OSHA PROCESS SAFETY (29CFR1910.119):

NITRIC ACID: 500 LBS TQ ($\geq 94.5\%$ by weight)

STATE REGULATIONS:

California Proposition 65: Not regulated.

CANADIAN REGULATIONS:

WHMIS CLASSIFICATION: Not determined.

EUROPEAN REGULATIONS:

EC CLASSIFICATION (ASSIGNED):

O Oxidizing

C Corrosive

EC Classification may be inconsistent with independently-researched data.

DANGER/HAZARD SYMBOL:

O Oxidizing

C Corrosive

EC RISK AND SAFETY PHRASES:

R 8 Contact with combustible material may cause fire.

R 35 Causes severe burns.

S 1/2 Keep locked-up and out of reach of children.

S 23 Do not breathe gas, fumes, vapor, or spray.

S 26 In case of contact with eyes, rinse immediately with plenty

of water and seek medical advice.
S 36 Wear suitable protective clothing.
S 45 In case of accident or if you feel unwell, seek medical
advice immediately (show the label where possible).

CONCENTRATION LIMITS:

C>=70%	O; C	R 8-35
20%<=C<70%	C	R 35
5%<=C<20%	C	R 34

GERMAN REGULATIONS:

WATER HAZARD CLASS (WGK):
STATE OF CLASSIFICATION: VwVwS
CLASSIFICATION UNDER HAZARD TO WATER: 1

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

SECTION 16 OTHER INFORMATION

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